IN THE SUPREME COURT OF THE UNITED STATES.

The Carnegie Steel Company Limited, Plaintiff and Petitioner,

vs.

Cambria Iron Company, Defendant.

SUPPLEMENTAL BRIEF FOR DEFENDANT.

In the absence of any intimation from the court as to particular points as to which they wish counsel to address themselves in the argument of this case, and in view of the fact that a careful examination of the petitioner's briefs leaves us with the conviction that our own brief is fully responsive, we have had some doubt as to whether it was advisable to burden the court with any additional printed matter. It has seemed to us, however, that perhaps a brief setting out of some of the salient points of our case might be of assistance to the court, and with this in view we have prepared the following matter, in no sense to take the place of our former brief on which we absolutely rely, but with a view of briefly putting the court in possession of the broad equities of the case without going into niceties of discussion and comparison as affecting the particular value of individual prior uses, all of which we have fully discussed in our main brief.

The fundamental questions in this as in every patent case are, as to the disclosure made in the specification and the invention referred to and fairly within the scope of the claim. In other words, what is the purpose or end had in view? What are the means or steps described by the patentee as those by which this result can be secured and as constituting his invention, and to what extent are the alleged novel improvements covered by the claims of the patent.

In the consideration of this case you are confronted by the fact that, after all the evidence making up the record was completed, and after the case had been argued on final hearing, the petitioner and its counsel were satisfied that its patent was ineffective and invalid, and so

declared in the most formal and public manner by the filing of their disclaimer in the Patent Office.

It is alleged in the petitioner's brief (see pages 110 *et seq.*) that the disclaimer was made because "defendant contended that certain portions of the specifications were broader than the claim. * * * The disclaimer having been filed in pursuance of defendant's criticisms, and to remove the ground therefor, how can the defendant now reasonably object to it?"

The explanation and the assertion contained in the above passage of the brief is alike absurd and inaccurate. There is no question affecting the breadth of the claim—the question is rather one of fundamental subject matter.

Petitioner's expert witnesses, with the single exception of Mr. Carnegie, assumed that the Jones patent described and claimed what they asserted to have been Mr. Jones' invention as put into practice at the Carnegie Works, and the Circuit Court embodies the same assumption in its opinion. Now this method asserted to have been initiated by Jones, and assumed to be described in his patent, is, as a matter of fact, not described in the patent, and is, both in result and in the steps necessary to produce the result altogether different from the method which really forms the subject matter of the patent, so different that, obviously, no one going to the patent for information and following the steps of the patent with intelligent purpose could secure the results alleged to be advantageous in the practical "Jones Process" as applied at Carnegie's Works, and so different that, by concensus of all the petitioner's witnesses, this practical "Jones Process" does not and cannot give the result which is the purpose of the patented process.

The purpose explicitly stated in the specification and incorporated in the claims not only by reference to the specification but by apt words in the claims themselves, is to obtain from uniform molten metal a product which will be substantially and practically uniform with regard to the admixed silicon and sulphur. But it is admitted by petitioner's witnesses and counsel that neither the molten metal resulting from the applied process of mixing nor the Bessemer steel made by the Carnegie Company from this metal is, in any practical or material sense, more uniform in its admixed silicon and sulphur than the original blast furnace metal. It is unnecessary to cite the evidence as to this; it is sufficiently collated and the fact stated as we state it, in the petitioner's brief on pages 12 to 17, and, in view of these admitted facts, it is manifest that, if Jones intended in his patent to describe the method of operation which they say he had previously installed in the

Carnegie Works, and which undoubtedly both the Carnegie Company and the Cambria Company, are in fact using, he deliberately misstated the purpose and result of his process and ascribed to it a purpose and function which it is incapable of fulfilling, and which Mr. Jones must have known it to be incapable of fulfilling.

But bad faith and deliberate misstatement on the part of the patentee is not to be presumed, and therefore, from the fact that the results, of the patented process and of the assumed process are fundamentally different, the presumption arises that the processes must be different,—and they are fundamentally different.

The asserted advantage, and the only advantage, claimed by the petitioner to be inherent in the so-called Jones process used by the parties to this case is that it prevents abrupt fluctuations in the silicon of consecutive converter charges and thereby facilitates the process of Bessemerizing because the operatives having charge of the converters are guided by one charge as to the proper treatment of the next, though the proportion of silicon may differ widely during the day. That this was not a purpose had in view by Mr. Jones in his patented process is manifest for two reasons, (1st), because he never in any wise suggests that his process has any effect upon the operation of Bessemerizing, that is the process carried on in the converter; and, (2d) because he does in his specification expressly and emphatically assert not only that his invention is not "limited to its use in connection with converters" but also that this is true "since similar advantages may be obtained by casting the metal from the mixing vessel into pigs for use in converters, puddling furnaces, or for any other uses to which it may be put in the art." This clause of the patent, which is one of those the petitioner has tried to eliminate by disclaimer, does not, we think, affect the necessary construction of the patent, because it is merely declaratory of a fact, the fact remaining the same whether it is stated, as Mr. Jones states it, or left unstated because inherently self-evident.

The patent states as the sole purpose and advantage of the Jones process, that it gives a product uniform in admixed silicon and sulphur, and it is obvious that this advantage is inherent in the mixed metal irrespective of its mode of subsequent treatment, and that no matter how it is further treated it will give a uniform product.

That the clause in question effectually negatives the assumption that Jones had in view the behavior of the mixed metal in Bessemerizing as distinguished from its effect on the character of the product, is certainly important in view of the position taken by the petitioner,

but if Mr. Jones had not thus emphatically estopped himself and his assigns from claiming that his process had any peculiar relationship to Bessemerizing, it would still be true that the patent has in fact nothing to do with the Bessemerizing operation and affords no suggestion which justifies such a construction.

Again, the essential features of the assumed Jones process, the one feature upon which all its merit is alleged to hang and by which the plaintiff's experts endeavor to distinguish it from the prior art, is that it involves,—first, the use of a mixer or reservoir having a capacity very considerably in excess of the batches of blast-furnace metal which are dumped into it and of the charges withdrawn from it for use in the converters, and,—second, the use of this large reservoir in such a way that it is kept practically filled, new charges withdrawn from it being practically at once replaced by further blast-furnace metal dumped into it in practical alternation with the withdrawals,—the result being that there is always contained in the mixer reservoir a relatively greatly preponderating mass of mixed metal as compared with the charge of incoming metal and the contents of the mixer at any one time being therefore dominated as to the distribution of silicon by the percentage present in the residue or great mass as compared with that present in the relatively small addition. The result of this is, petitioners claim, that consecutively drawn converter charges will, with regard to their silicon percentage, vary but slightly, notwithstanding the admitted fact that in the course of a few hours' or a day's run the variations in silicon and sulphur will be very great and the product of the converters therefore in no wise practically or substantially uniform with regard to the silicon and sulphur.

The Jones patent declares that under the Jones system of mixing "all the charges delivered to the converter from time to time will be substantially uniform," and again that he secures "as much as possible uniformity in the character of the metal which is fed to and delivered from the tank," &c.

Petitioner's brief, on the contrary, asserts that the Jones method as practiced involves the treatment of "heats of metal which differed widely from each other in composition" (page 12), and that "the absolute composition of the metal at the beginning of the day may differ widely from the metal taken from the mixer at the end of the day." (Page 15). Similar statements appear throughout the brief.

But, turning back to the patent, you find—not only that the assumed Jones process is incapable of securing the result stated by Jones to be that sought and secured by his patented process,—not only that the alleged advantage of the assumed Jones process is not stated or suggested as attainable by the patented process,—but also that the patent nowhere intimates that the residue which Jones suggests, as an advisable modification of his broad mixing process, should be preponderating or dominating.

On the contrary, you find, in the first place, that the second claim, the only one which refers to the residue, is so drawn that any residue would be within its terms; in the second place, you find as to the assumed bulk of the residue, that it is described in the patent by no more definite terms than "a considerable quantity" which certainly can qualify the broad language of the claim no further than to exclude from its scope an absolutely inconsiderable quantity, and, in the third place, you find it stated as to this residue that its special function and reason for use is that "I thus (*i. e.*, by using the residue as an ingredient for the further charge) secure as much as possible uniformity in the character of the metal." Now the fact being, as all the petitioner's witnesses testify, that the preponderating and dominating residue of the assumed "Jones Process" is a factor which in practice excludes the possibility of mixing to substantial uniformity, it follows not only that a dominating residue is not specified and not suggested in the claim, but that it is, as a matter of fact, excluded because where the residue dominates the mixture, the result sought, practical uniformity, is absolutely unattainable.

Again, as bearing on this matter of the proportion of the residue, it is true that the clause on the first page of the patent in which Mr. Jones states that his invention may be practiced in various forms of apparatus, including, for example, "a charging ladle," is fatal to the assumption that Jones had in view the use of a residue of greatly greater proportionate quantity than the amount drawn off from the mixer, and generally in a charging ladle, to charge the converter, but the elimination of this stated fact from the specification, even if it could be accomplished by a disclaimer, as the plaintiff has undertaken to do it, could not, in any material respect, change the construction of the patent, and certainly could not make it express this fundamental feature of the assumed "Jones process," to wit, the dominance of the residue.

Again, the second claim of the patent, the only one in controversy, is drawn to cover the process made up of the several steps which end

in securing uniformity in the constituent parts, silicon and sulphur, of the mixed metal. The first claim of the patent includes, as a step of the process covered, the further step of refining the mixed and uniform metal, but the second claim is expressly limited to the process of mixing to uniformity—"preparatory to further treatment." Now, because, as a matter of fact and of law, the steps which constitute the patented process end with the mixing to uniformity, it is obviously unimportant what further treatments Mr. Jones had in view. Therefore, in seeking to eliminate from the specification, by disclaimer, Mr. Jones' express statement that by further treatment he had in view its use in converters or in puddling furnaces or its use by casting it into pigs or "any other uses to which pig iron may be put in the art," the petitioner could not change this claim from its present subject matter and make it a claim which includes the further treatment of the mixed and unified metal in Bessemer converters (Grant *vs.* Walter, 148 U. S., 547), not to speak of the further modifications which would be necessary to limit the claim—on the use of a huge mixing receptacle,—the maintenance of a dominating pool therein, and the alterations of the withdrawals and charges which are essential to the carrying out of the assumed "Jones process" as described by the plaintiff's experts.

Every fact we have above asserted is incontrovertibly drawn either from the patent or the petitioner's testimony and argument, and every conclusion we have deduced therefrom seems to us logically inevitable. The petitioner's pretense that the defendant's counsel have cavilled at the scope of the claim, and that the disclaimer was made merely to humor an unduly hypercritical criticism as to a matter which, after all, only related to a mode of expression, is absolutely without basis. The point which we made, and still make, is that there is a fundamental difference in subject matter between what we refer to as the assumed "Jones process" and the real Jones process of the patent.

The whole structure of the petitioner's case is made to hang upon the statement, twice made in the specification, that the presence of the residue has an effect in causing the fluctuations in the quality of the successive tappings of the reservoir to be gradual. But this is expressly stated by Jones in connection with the assertion that the utilization of the residue as an ingredient of the charge is a factor by which he secures "as much as possible, uniformity in the character of the metal." It is thus apparent that Jones did not have in view the utilization of a residue in such a way as to prevent abrupt fluctuations in

quality without securing practical uniformity, his sole asserted object, and it is nowhere suggested in the patent that the prevention of abrupt fluctuations has any utilizable value apart from its tendency to secure uniformity. In fact as we have, we think, made clear in our brief (see particularly pages 31 to 37, and again the matter on pages 54 *et seq.* under the heading, "The Dominant Pool"), the reference to the prevention of sudden fluctuations in the quality of the metal is to be read in connection with the stated purpose to secure practical and substantial uniformity, and with the demonstrable fact that in the use of the mixture by alternately charging it and emptying it down to the determined residue, there is, in the charges drawn from it for conversion or other use, absolute uniformity in each mixed batch of metal—and an inevitable though slight variation from uniformity in charges drawn from different mixed batches, which variation will be made the more slight and the end of practical uniformity therefore more nearly secured by including in each mixture a considerable but not a dominating residue or remainder from the former mixing.

This interpretation of the patent is consistent with the whole specification and with the claims. It is, therefore, we submit, the necessary interpretation as contrasted with that contended for by the petitioner which is absolutely inconsistent with every other expression and statement found in the patent and involves implying, as against the expression of the patent, a method or sequence of steps nowhere expressed, and, certainly, if capable of being the subject matter of an invention and therefore not obvious to those skilled in the art, nowhere implied.

The fundamental basis for the petitioner's contention is the assertion of its witnesses, other than Mr. Carnegie, that Jones never did in fact apply such a process, as his patent describes at the Carnegie Works, but, on the contrary, had applied, about a year before his patent application was filed, the process which they described and assumed to have been that intended to be covered by the patent. They ask you therefore to assume that it must have been this applied process, which they describe to you that the Jones patent was intended to cover and protect. But in taking this position, as we show on pages 39 to 41 of our brief, they are in conflict not only with the plain statements of the patent and its absolute silence as to the alleged vital features of the assumed process, but also with the testimony of Mr. Andrew Carnegie, to whom Jones explained the purpose of what he conceived to be his invention just, in substance, as it is explained in the patent itself.

As to why Mr. Jones elected to patent the process which he did patent and why he did not patent the process of making Bessemer steel which the petitioner's witnesses claimed was his great invention, we do not fully know, and the reason is, after all, immaterial. We do learn something, however, from the Patent Office history of this case, which is embodied in our brief, pages 42 to 46, where we find that Mr. Jones originally applied for a patent covering, with considerable breadth, the storage of molten metal with a view to improving its quality. We find that this original application which, while it did not describe what is now claimed to be his real invention, was still, possibly, broad enough to include it, was rejected on prior publications, in view of which Mr. Jones entirely redrew and reframed his specification and claims,—eliminating from both all reference to the storage of metal and—explaining in filed argument that mere storage, such as had been before used, did not have the effect of securing a uniform product. The amendment filed, which limited the Jones process to such mixing as produced substantial uniformity,—and uniformity, moreover, in the two ingredients, silicon and sulphur,—was resworn to, as it had to be, for the amended application was for a virtually different invention from the original. It is thus shown that the Examiner was induced to allow the patent as one distinctly for a process of mixing to uniformity as contrasted with a process of storing molten metal with merely incidental mixing, which storing process was stated by Jones and assumed by the office to be incapable of securing uniformity.

The reason why Jones never explained the process which it is stated he was using, and which did not secure uniformity, but did have an asserted important bearing on the process of Bessemerizing, is probably because he never conceived of that process as one which had any substantial and patentable novelty. But be that as it may, and whether the process alleged to have been installed by Jones might have been patented or not, it never was patented, and never was, in fact, disclosed either in the original application or in the issued patent.

Now a few remarks as to the petitioner's treatment of the prior art as evidenced both in publications and old-time practice.—Their method is to endeavor to evolve an expression of the actual practice carried out in recent years by the plaintiff and defendant companies which will be distinguishable from what is fully and explicitly disclosed in prior publications or in the testimony of witnesses as to prior uses; then they tell you that Jones invented the process or series of

steps so evolved and ask you to protect it and restrain the defendants from its continued use. What the plaintff has thus evolved as a patentable invention and how it contrasts with the real invention specified and claimed in Jones' patent, is made lucidly manifest by the revision of the claim on page 75 of our brief, so as to make it express what petitioners assert and the Circuit Court found was the invention to be inferred as that of the Jones patent. You will find when you come to carefully examine the prior state of the art that, at least, every addition to and subtraction from the steps of the original claim, as shown on page 75 of our brief, was absolutely necessary to even plausibly distinguish the subject matter of the claim from what was clearly shown to be old and matters of common knowledge. With all the alterations and additions, it is still, in our judgment, absolutely lacking in patentable novelty, and we believe we have so demonstrated, but that is not, we think, necessary, and, as a matter of fact, many of the older publications and many of the older uses constitute a much closer approach to the process which we are charged with infringing and which is claimed to have been Jones' invention than it is the process of the Jones patent itself. This is markedly so of the British Patent to Deighton, reviewed in our brief, pages 195 to 207. This patent is expressly, both in specification and claims, a patent, not for mixing molten metal to secure uniformity in product, as Jones patent is, but a patent for mixing molten blast furnace metal in a huge mixer or receptacle to improve the quality of the metal as used and for use only in the Bessemer converters. In short the patent is, just what Jones' patent is not—one for improving and facilitating the Bessemerizing operation, having in view not only the obtaining of a better mixture, but also the continuity of use of the plant which, as we have shown in our brief, is the vital and real reason why the defendants use, and must use, a reservoir in connection with their immense producing and using capacity. In our brief we have set out at length the reasons which lead us to the conviction, which we think must be adopted by the court, that the Deighton process as described is substantially identical with the defendant's process as practiced, but if, for any of the many reasons alleged in behalf of the plaintiff, Deighton's patent falls short of a complete disclosure of our modern practice, it is still true, we submit with confidence, that it is as specified, a much closer approach to our practice than is the process described in the Jones patent; and this is equally true of the disclosure made in the Holley report (brief, page 143, *et seq.* and in the Snelus publications reviewed in connection with the Holley report in our brief, pages 147 to 149.

As against the claim that the Holley, Snelus, and Deighton publications should be strictly scanned and narrowly construed, because it is not shown that either of them applied their published process to practical use, we beg to submit what seems to us the obvious proposition, that Jones who, on the plaintiff's evidence, had actually and for a year used the process before he filed his application for a patent, sinned against light and knowledge in his omission to set out these features which are now claimed to be the vital and essential features of the successful process, and therefore his patent is to be much more narrowly construed than in the case of the prior inventors who had given to the world the best and all that they knew.

The issue made by the Jones patent, and with reference to which the general state of the art must be considered, is the specified and claimed discovery or invention—that molten metal of ununiform character could be made uniform as to its contained silicon and sulphur by mixing together ununiform portions of the molten metal so that the mixture would average up to the desired "practical" and "substantial" uniformity, and the further discovery and invention that this practical and substantial uniformity in the distribution of silicon and sulphur could be best secured by operating the mixer without "entirely draining or emptying" it between consecutive charges but by leaving some considerable portion of the mixed charge to form one of the several ununiform portions of metal making up the next charge and mixture. This is all that is taught by the patent and all that is material to the end or result announced by the patentee and to which his second claim is specifically limited.

Is there anything new in the invention specified and claimed by Jones? It is not even pretended that there is. The West Cumberland practice (see our brief, page 145 *et seq.*) unquestionably discloses both the operation and purpose of the broad invention, and it further relates peculiarly and exclusively to the treatment of direct metal from the blast furnaces and with reference to its sole use in Bessemer converters, though this is immaterial as bearing upon the Jones patented invention. The Kirk publication (see our brief, pages 159 to 162) discloses a continuous process of mixing ununiform molten metal for the purpose of improving its quality, that is, its uniformity, in which the fresh additions of ununiform metal are always charged into a residue, and, when his original application was confronted by and rejected on this publication, Mr. Jones admitted its pertinency by reforming his application so as to exclude from it the storage of molten metal and limit it

to such mixing as produced uniformity in silicon and sulphur, alleging to the Patent Office that a method of storing molten metal with incidental mixing could not secure uniformity, and was therefore distinguishable from his method of mixing to uniformity. That is, he urged as the feature distinguishing the process described by Kirk from his own process, the fact that Kirk preserved a dominating pool which, by reason of its dominance, prevented mixing to a standard quality; the identical fact which is true as to the defendant's use and which is now argued to be the distinguishing feature of the Jones invention.

Coming, then, to the Whitney and like foundry uses (see our brief, pages 162 to 179), we find in long and extensive use practically the identical process described by Kirk in that a residue, and a dominating residue, was always maintained in the mixer, but a process which, as a matter of fact, did give substantial and practical uniformity in product. What, then, is left of possible novelty in the specified and claimed Jones process?

The Circuit Court, in what Mr. Reed's brief refers to as its argument, was reduced to finding the distinction in the fact that the foundries did succeed in producing practically uniform metal while Jones did not,—and the exact situation can be stated by saying that, though the issue of the patent was secured from the Patent Office by the assertion that the foundry mixing did not and could not produce uniform metal, whereas the Jones process did and was so limited in its claims, the Circuit Court on the other hand distinguishes the foundry practice from Jones because the foundries, did produce uniform metal and Jones, the court finds, did not and could not.

Again, take the proof as to the use in the Bessemer mills of the reservoir or "accumulator" ladle, discussed in our brief, pages 179 to 193.—It is proved, not only as a practice but as the uniform practice of all the American Bessemer mills, that they delivered their molten metal, drawn from, generally, several producing furnaces, into an intermediate ladle from which in turn the Bessemer converters were charged. The peculiarity of the American practice as distinguished from that used abroad, was that this receiving ladle was made of a capacity to hold a very considerable quantity of metal in excess of the converter charges which were poured out of it, so that, in practical use, the reservoir ladles were always charged with a mixture of molten metal of which a considerable body remaining from the last mixture was an ingredient.

It is attempted by the petitioner's counsel to distinguish the old uses, in which remelted metal was mixed before further treatment,

from Jones by implying into the Jones patent a limitation to the mixing of only such molten metal as was drawn directly from blast furnaces and thus exclude from consideration processes of mixing the same molten metal after it had been remelted. That this is not a limitation of the patent and would be, at best, a distinction without a difference, we have shown, we think, in the portion of our brief printed on pages 68 to 71; but, aside from this point, we desire particularly to note here, and to answer, the attempt of counsel to argue—that, as in the remelting of the iron it was possible to obtain a better mixture than was present in the melted pigs, it was therefore to be assumed that in the case of remelted iron no improvement in quality by mixing was to be secured, and therefore, further, the apparently identical processes of mixing molten metal shown in the old uses and publications was really not the same as the Jones method. The fact is that while it is possible, by careful selection in the mixture of the pigs, to obtain better mixed iron from a cupola furnace than is the pig melted in it, it is impossible, owing to the irregularities of the working of these furnaces, to obtain practically uniform mixtures, and, further, it is true that, unless great precaution in the selection of the pig is observed, little or no improvement over the furnace metal is to be looked for or secured.—That even the most careful selection of the pig to be remelted will not result in uniform iron is proved by the wheel foundry witnesses, whose testimony is reviewed. (Page 162 *et seq.* of the brief.)—That the irregularity of the remelted metal was notorious and the mixture of the molten product of the remelting furnace recognized as a remedy is proved, aside from the testimony of witnesses, by the printed publications of Kirk (see brief, page 161) and the article from *London Engineering*, quoted from on page 169 of the brief, and—that the useful function of the reservoir ladle as used in the Bessemer steel mills, in that it mixed and improved the quality of the remelted melted, was fully recognized, is proved, not only by the testimony of the witnesses to whom we refer in discussing this use, but by the published announcements of Mr. Snelus, referred to on page 188 of our brief. It is pertinent to note here that the proofs show that the defendants from the year 1881 to the present day have charged their cupolas or remelting furnaces promiscuously with unselected pig metal, which is practically the same thing as charging them direct from the blast furnace. Can it be doubted then that the mixing function of the reservoir ladle has had and has been recognized as having an important bearing on the successful use of this metal in the converters. (See brief, pages 186–7). We submit, then, that it is absurd to argue

that the admitted mixing and averaging up which occurred in a reservoir ladle was not a useful feature of the use of that ladle, and not a feature which was intentionally availed of, and the utility of which was recognized.

But suppose that the mixing function which unquestionably and admittedly takes place in the foundry reservoir and the Bessemer reservoir ladle had not been fully appreciated and had not been the primary motive for the use of these ladles. Suppose, as the Circuit Court finds and counsel argues, that the governing reason for the employment of this method, which involved the mixing and averaging up of the iron, was storage and not mixing. What difference does it make? The process of mixing, either to Mr. Jones' announced end of uniformity or to such a degree as was incident to the storage of the metal, unquestionably took place, and it certainly cannot be that this defendant, or any other of the outside public, can be prevented from using this old process, which unavoidably involved mixing, because Jones is alleged to have had a higher appreciation of the value of this function than the prior users.

It is true that Jones was the first in this country to actually mix molten metal on the large scale indicated by his suggestion and practical employment of a reservoir holding from eighty to one hundred tons, but this was obviously a mere matter of degree, and the process is the same, as Mr. Jones himself points out, whether carried on in a charging ladle or in a hundred-ton reservoir. Moreover, if the greatly increasing quantities of metal produced in blast furnaces was to be handled in the familiar way, it was obviously necessary that mixers or reservoirs of large capacity should be used, and this was recognized ten years before Jones is assumed to have taken the matter into consideration. Thus,—Snelus in 1878 (see brief, page 148) refers to Mr. Fritz's intention of erecting, for the purpose of mixing the iron, a ladle holding thirty tons;—Holley, in his report, states, and reiterates his statement, that the mixing must be on a large scale;—the designers of the Moss Bay plant, described by Holley and in our brief, page 143 *et seq.*, had provided for a mixing reservoir holding sixty to eighty tons, and the Deighton patent shows by scale, that the mixing reservoir he had provided for, was to hold at least a hundred tons.

If you were going to treat the product of a plant of blast furnaces producing, as the defendant's furnaces do, fifty or more tons at a tap, in the same way that the American mills had treated their remelted

cupola metal, with their relatively dribbling taps of three or four tons, it was obvious and inevitable that immensely larger reservoirs should be provided to receive, store, and mix the metal, and the differences between the old ladle practice and the practice which the defendants installed and are now using was only such as was obviously necessary and practically unavoidable in the handling of the greatly increased quantity of metal in as nearly as possible the same way.

There was a question and a problem confronting every Bessemer steel mill which contemplated the use of direct metal in its converters, and that is the problem to which Mr. Holley emphatically called their attention, namely, whether or not they were making iron sufficiently regular in its quality to be economically used in the converters. It was obvious, as Mr. Holley states, that the quality of the iron could be improved by mixing, but as a practical man, he recognized this as an expedient which, carried on under practical conditions, while alleviative was not necessarily remedial. Its effectiveness depended, from his point of view, upon the amount of irregularity to be overcome. The British mills were successfully using their blast furnace metal and, as he reports, were saving as much as a dollar a ton, in some cases much more, on their Bessemer rail product, and in the case of the West Cumberland Company, whose saving amounted to as much as a dollar and twenty-five cents per ton, they were mixing the iron from two or more blast furnaces before charging it into the converter; but the American mills could not, Mr. Holley advises them, expect such advantages because their blast furnace metal was more irregular than the British at the time he reported. What they had to do was to improve the quality of their iron product and after that, the obvious remedy was storing and mixing in large reservoirs.

Of course it was obvious; the Wheeling foundries described by Kirk and the Car Wheel Foundries were storing and mixing their iron, in the latter case to almost perfect uniformity. The American Bessemer mills were storing and mixing their iron in the reservoir ladles with acknowledged great advantage, both as to the rapidity of production and the quality of the product. Deighton and Snelus had pointed out the advantage inevitable from the mixing of the blast furnace metal in the improvement of its quality, and the only question affecting the Deighton scheme in the modification in course of erection at Moss Bay was, as Holley points out, the advisability of using a mixing reservoir which was tapped from the bottom instead of the obvious substitute, which he also points out, a tipping receptacle like the reservoir ladle with which the Americans were familiar.

The art, then, taught everything which either the petitioner or de-

fendant companies have done and accomplished. There was and is no secret, no mystery in or connected with this most familiar art of mixing, either by batches, or continuously as an incident to the storage of the fluids to be mixed. Mixing was as familiar an expedient in the compounding of molten iron as it is in compounding prescriptions in an apothecary's shop, or as it is of the ununiformly dirty water, which, in many of our cities, is compounded in the town reservoir and distributed to the citizens in what may be described, as an average condition of filth. The problem, then, solved by Jones was simply the one announced by Holley, the determination as to whether or not the Carnegie Company was making iron good enough when mixed under practical conditions, to be used for the supply of the Bessemer converters. Precisely the same problem confronted the Cambria Company, when years afterward they installed their three-hundred ton reservoir, and precisely the same problem confronted and confronts every one who has undertaken to use direct metal, or may undertake to do it in future.

We cannot leave this subject without special comment on the reiterated assertion of petitioner's counsel, both in brief and argument, that Jones' invention, whether patented or not, was practically at the base of the use of direct metal in making Bessemer steel. These assertions are irreconcilable with the facts, for not only was the use of direct metal contemplated and described by Bessemer in his original patent, but it was, throughout the Continent of Europe, the method of operation originally installed and successfully maintained. The reason it was not earlier adopted in Great Britain and America was, primarily, because in both countries the Bessemer industry grew up separate and apart from the business of making iron, the Bessemer steel companies investing their capital in the steel plants and being satisfied to purchase their iron in the open market, which, of course, involved the remelting of the iron before Bessemerizing. As the originally immense profits of the Bessemer steel companies decreased under competition, the question of decreasing the cost of manufacture, both by making their own iron and by using it direct, though involving immense outlay in the reconstruction of their works, forced itself upon the steel manufacturers, and in the early seventies we find it to have been the vital question at their annual meetings, those of the British producers who had direct metal within reach promptly and successfully introducing its use, while, naturally, those of the manufacturers who did not have access to direct metal were still expressing doubts as to the advantage of its use. The facts are shown sufficiently in the Journals of the Iron and Steel Institute, extracts from which are included in the Record,

and the state of the art is ably summed up in Mr. Holley's report for the year 1877, which shows both that direct metal was being extensively used in the converters, and sometimes without admixture and sometimes with admixture of the iron from several furnaces.

Again, it is true, that for several years before the Jones invention is alleged to have been made, two of the largest producers in America were using direct metal on a large scale, producing millions of tons of Bessemer steel from it, and one of these producers was the petitioner company. The defendant company followed Holley's advice found on page 845 of the record and waited until their output of direct metal was sufficient to supply a complete plant, when the use of such metal first became commercially important. Their output, arising from rebuilding and enlargement of the plant, first reach this point in 1895, as shown by Morgan. (R. D. Q. 162, page 417, and Exhibit Cambria Product Statement, page 426.

Under these unquestioned facts, it is, we submit, absurd and in the highest degree, to speak of the assumed "Jones Process" as being in any wise at the base of the use of direct metal.

The witnesses for the petitioner, in describing their use of direct metal prior to the introduction of the "Jones Process," tell us that they met with great difficulty owing to the irregularity of the silicon, and that it was a question with them whether or not, upon the whole, they were gaining anything in using direct metal over the use of remelted metal. But giving full credence to this *ex poste facto* expression of doubt, there were two facts involved in their practice which showed that they had neglected the teaching of the prior art, and the most notable of these facts is that they did not mix their direct metal but used it just as it came from the furnace. In neglecting to mix the metal they were disregarding not only Mr. Holley's emphatic advice to them in his 1877 report, but the successful practice of the West Cumberland Company and others of the British manufacturers, and nothing more was needed than to catch up with the procession instead of lagging behind as they had elected to do. The other point in which they fell behind the state of the art was that they discarded the reservoir ladle which was a characteristic feature of the American Bessemer practice, by means of which it was admitted, that the operation of the converters was greatly facilitated and their product increased, not to speak of the effect upon the mixture of the iron, and in place of the big reservoir ladle they used the little charging ladle holding only a single converter charge. It is thus apparent, we submit, that while, doubtless, the installation of the process which permitted again both the mixing of the metal and its storage, was a great step in advance for the Carnegie

Works; it was a step which was necessary to enable them to catch up with the procession and not one which put them in its lead.

Before leaving the subject of the defendant's use, we wish to note a somewhat confusing controversy which has arisen with regard to the governing purpose of the defendant in installing and using its reservoir and the effect of that purpose upon the question of infringement. The testimony of the defendant's chief engineers is to the effect that they installed the reservoir because they needed it for the storage of the metal and to serve the usual function of a reservoir in equalizing the supply and demand. It was quantity rather than quality which required its use. (Brief page 105–108.) Such a use obviously requires the reservoir to be used as all reservoirs are used, by keeping it, as nearly as practicable, full, but the body of metal maintained in the reservoir was, according to the defendant's testimony, regulated purely by the questions of supply and demand and not with respect to the character of the mixture secured as an incident to the storage.

Now, the petitioner's witnesses and counsel have always admitted that we have a perfect right to store our metal and that it was an old and common practice in the art, but they offer their opinion that we did not instal and did not use our reservoir because of our appreciation of its function as a means of storage, but because, primarily, we wished to avail ourselves of its function as a mixer. The alleged fact upon which they assume to base this opinion, is the fact that we are careful not to empty our reservoir beyond a certain point. The statements about this are controverted, but we agree with Mr. Reed (see his brief, page 21) that it does not make any difference. There isn't any question about the fact that we use our reservoir as a reservoir is always used and keep it ordinarily well filled, so full that the metal maintained in it is, no doubt, in its effect upon the mixing, dominant and thus a factor which, as in the petitioner's use, absolutely prevents anything approximating to a uniform product, and therefore, we submit, that while our practice is, as we have urged, the one taught by the whole prior art, it is a different process from the specified and claimed process of Jones, which was only such mixing as produced uniformity of product and which necessarily excluded the presence in the mixing receptacle of a dominant residue, and therefore excluded the use of the mixing receptacle as a reservoir, and as we use it.

Respectfully submitted,

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